NDCEE

National Defense Center for Environmental Excellence

DoD Executive Agent
Office of the Assistant Secretary of the Army (Installations and Environment)

Joint Service Initiative-CONsolidated and Deployable Omni-Recycling (CONDOR) System

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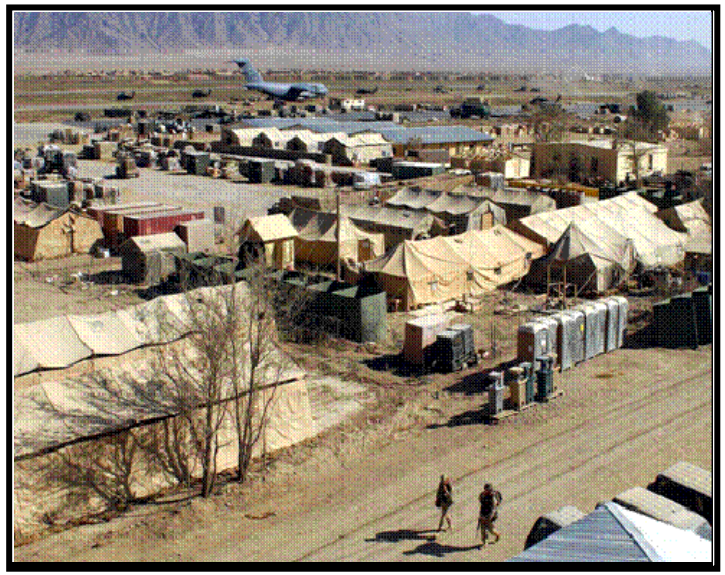
Background

- Deployed airbases at risk
  - Current waste treatment and disposal methods
    - Require a large number of ground support personnel (i.e., convoys)
    - Pose a threat to security and staff of the base because contractors have access to base to remove waste
  - Water is an essential and high volume logistical resource for military operations
    - Self sufficiency is required to minimize logistic burdens of non-weaponry supplies
  - Wastewaters generated from living quarters
    - Must be effectively managed to maintain sanitary conditions at the operations facilities

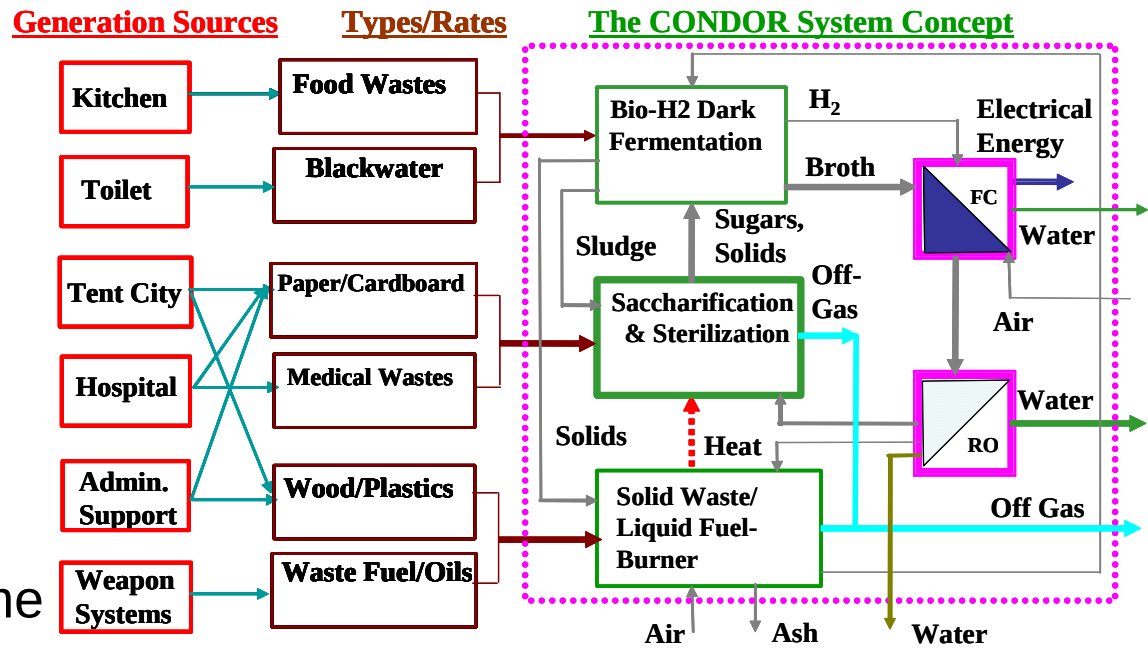


Objectives

- Assist Air Force Research Laboratory (AFRL/MLQ) with:
  - Completion of the engineering design
  - Fabrication of the CONDOR prototype system
- Determine and assess Joint Service interest in the CONDOR system

Technology Overview – Waste to Resource

- AFRL/MLQ concept processes multiple waste streams
- Products include:
  - Filtrate and retentate water
  - Hydrogen gas
  - Non-toxic off-gas
  - Ash
- Significantly reduces volume of solid and liquid wastes
- Unique microbial digestion of liquid waste which produces hydrogen – carbon dioxide (CO_2) gas



FC – Fuel Cell RO – Reverse Osmosis

CONDOR Concept Schematic

Accomplishments and Results

- Completed Joint Service Interest Investigation
- Completed Engineering Design of Prototype
- Completed Fabrication of Prototype
- Delivered Prototype to AFRL/MLQ Personnel at Tyndall AFB for Optimization Studies

Accomplishments and Results (cont.)

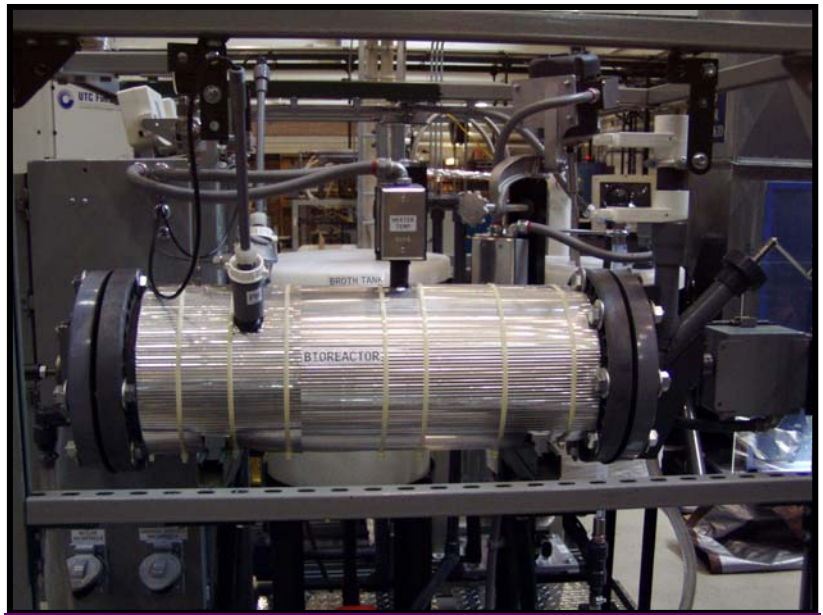
- Integrated process subsystems
- Utilized economical Touch Panel operator interface with integrated Programmable Logic Controller (PLC)

CONDOR Prototype

Hydrothermal Processor

Accomplishments and Results (cont.)

- Custom Bioreactor design enables AFRL/MLQ to test larger volume of waste materials
- AFRL/MLQ will utilize this prototype to evaluate interactions of the integrated subsystems and optimize system operating parameters

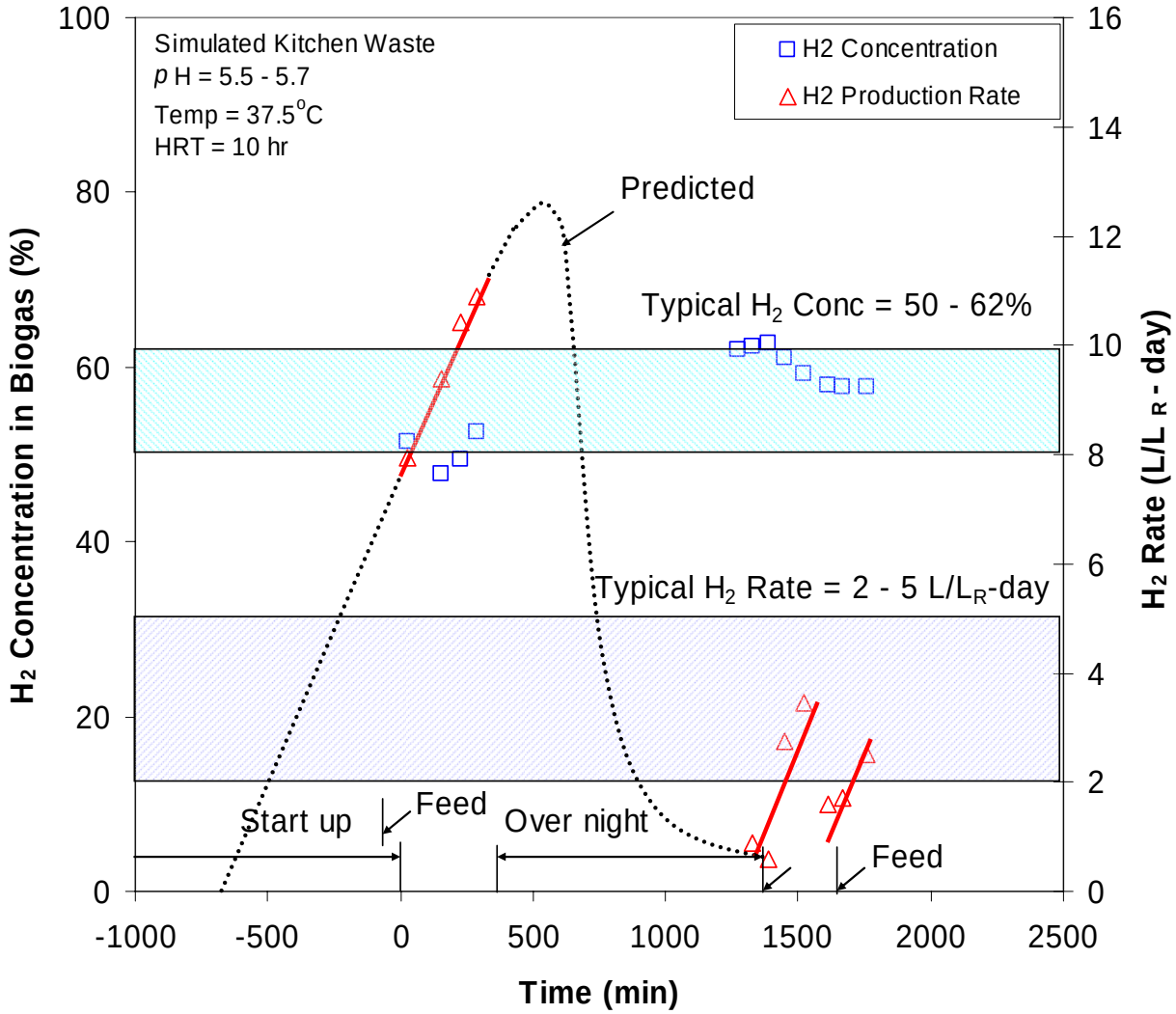


Dark Fermenter / Bioreactor

Path Forward

- Prototype Design and Fabrication Project completed September 28, 2006
- Assist AFRL/MLQ personnel with information dissemination
- Follow-on tasking to evaluate interactions of the integrated subsystems and optimize system operating parameters

Initial Prototype Experiment



AFRL/MLQ FY07 Schedule

- Optimize individual components and software of prototype CONDOR
- Characterize individual component and integrated system performance with simulated waste streams
- Perform process parameter sensitivity studies
- Assess feasibility of operating under real world conditions (i.e. actual wastes, blackwater)
- Complete AFRL S&T effort

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